

Sea Turtles Relative Abundance & Seasonal Movements in the Tampa Bay Entrance Channel, FL

OBJECTIVES

- To establish baseline relative abundance data for sea turtles in Tampa Harbor entrance channel, Florida.
- To assess spatial distribution and seasonal occurrence of sea turtles through out the channel bottom.
- To assess the monthly occurrence and large scale movement patterns of sea turtles within the Tampa Bay region. To input this data into a regional Geographic Information System data base.
- To provide access to near real time data on sea turtle movements on the internet.

SEASONAL RELATIVE ABUNDANCE USING TRAWL SURVEYS

Turtles will be captured with trawl nets to determine their relative abundance in the channel prior to dredging. Methods and equipment will be standardized including data sheets, nets, trawling direction relative to tidal flows, length of station, length of tow, and number of tows per station. Data on each tow will be recorded using standard data sheets (Appendix A). The trawler will be equipped with two 60 foot trawl nets constructed from 8 inch mesh (stretch) fitted with mud rollers and floats as specified in the attached description (Appendix B).

The channel will be divided into 3 km (1.6 nm) long stations. The central 2 km (1.08 nm) of length in each station will be sampled. Based upon results of the pre-dredge survey conducted in March 1996 (Nelson 1996a) and relocation trawling conducted during April 1996 dredging (Nelson 1996b) in the Tampa Bay entrance channel, the level of effort will be double the level of that in other channels due to difficulty of capturing turtles. A minimum of 10 tows will be conducted in each of the stations. A total of approximately 90 paired net tows will be made for the survey. Trawling will be conducted with the tidal flow using repetitive 15-30 minute (total time) tows in the channel. Tows in each station will be made in the center, green, and red sides of the channel such that the total width of the channel bottom is sampled.

Positions at the beginning and end of each tow will determined from GPS and Loran positioning equipment. Tow speed will be recorded at the approximate midpoint of each tow.

WATER QUALITY AND PHYSICAL MEASUREMENTS

Water temperature measurements will be taken at the water surface each day using a Yellow Stone Instruments (YSI) water quality meter or equivalent. Weather conditions will be recorded from visual observations and instruments on the trawler. Weather

conditions that will be recorded include air temperature, wind velocity and direction, sea state-wave height, and precipitation. High and low tides also will be recorded.

SEASONAL MOVEMENTS ASSESSMENT USING SATELLITE TELEMTRY

Satellite telemetry techniques will be used to assess the monthly occurrence and large scale movement patterns of sea turtles within the Tampa Bay region. Turtles will be captured by trawling and equipped with a satellite transmitter. Only turtles large enough to carry a 400 to 600 gram satellite transmitter will be instrumented. The transmitter will be less than 5% of the total weight of the turtle. The transmitter will be shaped in a streamlined fashion so as to provide minimal drag to the turtle swimming. Transmitter will be attached to the turtle carapace using a marine epoxy and fiberglass.

The operating life of a satellite transmitter is estimated at 12 to 18 months; however, failure or loss of the tag may occur prior to this time frame. The satellite transmitters are operated through the ARGOS system. ARGOS uses receivers on board U.S. National Oceanographic and Atmospheric Administration satellites. Transmissions from the transmitters are received at the satellite and immediately down linked for real time data collection. The transmitters provide temperature sensing and activity sensing. The transmitter will provide information on location, tag temperature, mean submergence duration, duration of last submergence before transmission, and number of dives. Temperatures measurements have an accuracy of + 2o C. Location information is accurate to + 1 km: therefore, this information will be most useful for discerning large-scale movements patterns such as arrival and departure times in the channel area and times spent in different portions of Tampa Bay. Seasonal and temporal movement patterns generated from satellite data will help assess monthly relative abundance and may provide a tool to predict optimal dredging times to avoid sea turtles.

GEOGRAPHIC INFORMATION SYSTEM AND INTERNET HOME PAGE

Sea turtle locations derived from satellite telemetry data will be entered into ARCINFO GIS data base. This data will become part of the Florida State Wide GIS Data Base. In addition, we will establish a World Wide Web page on the Internet to allow daily access by interested individuals and agencies to sea turtle movements within the Tampa Bay area. This will be a cooperative study with Florida Department of Environmental Protection.

COORDINATION OF WORK

All aspects of the study will be coordinated with the US Army Corps of Engineers District, Jacksonville (CESAJ); the National Marine Fisheries Service, state resource agencies, and other appropriate technical personnel. Prior to each sample period, the local Coast Guard Station and law enforcement agencies will notified of the planned activities. Work will be conducted under NMFS Federal Permit No. 777 and Florida DEP Permit NO. 070.

PRODUCTS

Quarterly progress reports will be provided to Jacksonville District. A draft project report will be provided to Jacksonville District within 120 days of completion of field work. A final report will be provided within 90 days of receiving comments of the draft report.

SCHEDULE OF ACTIVITIES

Work will commence upon finalization of permits and contractual agreements. Trawling surveys will be conducted each of the four seasons (quarterly) for year one and for two seasons year two. Turtles will be affixed with satellite transmitters and monitored for at least one year. Satellite transmitters that continue to operate will be monitored during the second year. All work will be conducted in the time frame as specified; however, allowances may have to be made for delays due to inclement weather.

LITERATURE CITED

Dickerson, D., K. Reine, D. Nelson, and C. Dickerson. 1995. Assessment of Sea Turtle Abundance in Six South Atlantic U. S. Channels. U. S. Army Corps of Engineers Waterways Experiment Station, Miscellaneous Paper EL-95-5, 44 pp.

Moler, P. 1992. Rare and Endangered Biota of Florida: Volume III. Amphibians and Reptiles. University Press of Florida, Gainesville, FL 291 pp.

National Research Council. 1990. Decline of the Sea Turtles: Causes and Prevention. National Academy Press. Washington, D. C. 259 pp.

Nelson, D. A. 1996a. Assessment of Sea Turtle Relative Abundance in Tampa Bay Entrance Channel Prior To Dredging. Report to the U. S. Army Engineer District, Jacksonville, from U. S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS.

Nelson, D. A. 1996a. Relocation of Sea Turtle from Tampa Bay Entrance Channel During Dredging. Report to the U. S. Army Engineer District, Jacksonville, from U. S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS.

Pritchard, P., P. Bacon, F. Berry, A. Carr, J. Fletemeyer, R. Gallagher, S. Hopkins, R. Lankford, R. Marquez, L. Ogren, W. Pringle, Jr., H. Reichart, and R. Witham. 1983. Manual of Sea Turtle Research and Conservation Techniques, Second Edition. K. A. Bjorndal and G. H. Balazs, editors. Center for Environmental Education, Washington, D. C.

Teas, W. G. and A. Martinez. 1989. 1988 Annual Report of the Sea Turtle Stranding and Salvage Network Atlantic and Gulf Coasts of the United States, January - December 1988. Contribution No. CRD 88/89-19. Miami, FL, Coastal Resources Division, National Marine Fisheries Service.

TURTLE TRAWL NETS SPECIFICATIONS

DESIGN: 4 seam, 4 legged, 2 bridal trawl net

WEBBING: 4 inch bar, 8 inch stretch top - 36 gauge twisted nylon dipped side - 36 gauge twisted nylon dipped bottom - 84 gauge braided nylon dipped

NET LENGTH: 60 ft from cork line to cod end

BODY TAPER: 2 to 1

WING END HEIGHT: 6 ft

CENTER HEIGHT: Dependent on depth of trawl 14 to 18 ft

COD END: Length 50 meshes x 4 inch = 16.7 ft Webbing 2 inch bar, 4 inch stretch, 84 gauge braid nylon dipped, 80 meshes around, 40 rigged meshes with 1/4 x 2 inch choker rings, 1 each « x 4 inch at end cod end cover - none chaffing gear - none

HEAD ROPE: 60 ft « inch combination rope (braid nylon with stainless cable center)

FOOT ROPE: 65 ft « inch combination rope

LEG LINE: top - 6 ft, bottom 6 - ft

FLOATS: size - tuna floats (football style), diameter - 7 inch length - 9 inch, number - 12 each, spacing - center on top net 2 inches apart

MUD ROLLERS: size 5 inch diameter 5.5 inch length, number - 22 each, spacing - 3 ft attached with 3/8 inch polypropelene rope (replaced with snap on rollers when broken)

TICKLER CHAINS: NONE (discontinued- but previously used 1/4 inch x 74 ft galvanized chain)

WEIGHT: 20 ft of 1/4 inch galvanized chain on each wing, 40 ft per net looped and tied

DOOR SIZE: 7 ft x 40 inches (or 8 ft x 40 inches), Shoe - 1 inch x 6 inch, bridles - 3/8 inch high test chain

CABLE LENGTH: (bridle length, total) 7/16 inch x 240-300 ft varies with bottom conditions

FLOAT BALL: none

LAZY LINES: 1 inch nylon

PICKUP LINES: 3/8 inch polypropelene

WHIP LINES: 1 inch nylon